Title: Polyart Gallery

Brief Overview:

Students will investigate geometric concepts that are used in modern art. In cooperative groups the students will then create an original art piece using these concepts. Each piece is self-evaluated using an established price criterion that will determine the monetary value of their work. The students will independently compose a letter to a potential client explaining the geometric/artistic process and persuading potential customer to purchase the work.

Link to Standards:

- **Problem Solving** Students will use problems strategies to explore geometrical concepts in art.
- **Communication** Students will demonstrate their ability to communicate mathematically. They will read, write, and discuss mathematics.
- **Reasoning** Students will use models, known facts, properties, and relationships to explain their thinking.
- **Connections** Students will demonstrate their ability to connect geometric concepts to creation and analysis of art.
- **Computation & Estimation** Students will estimate cost in the creation of the art piece and computation in the analysis of the piece.
- **Geometry** Students will demonstrate their ability to describe and apply geometric relationships. They will explore the attributes of polygons, circles, angles, and lines. They will investigate the congruency and symmetry of various geometric figures and designs.
- **Measurement** Students will select the appropriate units of measurement and the tool to find the measurement. They will compare angles and apply measurement to interdisciplinary real-world, problem solving situations.
- **Patterns & Relationships** Students will demonstrate their ability to recognize and create geometric relationships.

Grade/Level:

3 - 5 (The unit provides many opportunities for differentiation through the student generated criterion.)

Duration/Length:

This performance task will take five (5) one hour sessions. The writing component can easily be incorporated during reading/language arts.

Prerequisite Knowledge:

This task is designed as a culminating event to a geometry unit. The prerequisite knowledge the students should have will vary depending upon the grade level objectives the teacher wishes to assess.

Objectives:

(The following objectives are suggested grade level guidelines that can be used to differentiate this task to meet the educational needs of the students.)

Students will :

3rd

- explore paths: straight, open, closed, simple.
- identify polygons and congruent shapes.
- measure perimeters of plane figures.
- find and record approximate areas of regular shapes.
- identify and describe different shapes which have more that one line of symmetry.
- explore geometric properties of familiar shapes such as square corners, number of sides, etc.
- create and describe a repeating geometric pattern.

4th (All objectives above should be included with the fourth grade objectives.)

- identify horizontal, vertical, parallel, intersecting, and perpendicular lines.
- construct a circle given its radius.
- estimate and record approximate areas of irregular shapes by counting square units.

5th (All objectives above should be included with the fifth grade objectives.)

- distinguish among acute, obtuse, right, and straight angle.
- measure and draw angles using a protractor and identifies congruent angles.
- name and describe circumference, diameter, radius, center, and chord of a given circle.
- demonstrate translations, rotations, and reflections.

Materials/Resources/Printed Materials:

- Matisse/Miro/Picasso Prints (**at least** one per cooperative group of four students)
- Ruler
- Tagboard
- Construction paper (different colors)
- Markers
- Scissors
- Glue
- Student Resources 1-4
- Teacher Resources 1-3

Development/Procedures:

Day 1:

- Introduce the task by displaying the web site advertisement. (Student Resource 1)
- Read and discuss the request and its requirements.
- Display various Matisse, Picasso, and Miro reproductions (Teacher Resource 1).
- Elicit responses from the students analyzing the geometric concepts represented.
- List or web (Teacher Resource 2) the student generated geometric analysis.
- Rank the geometric concepts from **most common** to **least common** in cooperative groups (Student Resource 2).
- Average the results from the groups to develop a class ranking.

Day 2:

- Using the suggested Price Criterion (Student Resource 3), each cooperative group will assess the value of a different reproduction.
- Present the groups' assessments.

Day 3:

- Using art materials, students will work cooperatively to design and create an art piece that is artistically pleasing and valuable based on the Price Criterion {Students will use a combination of the artistic styles demonstrated by Matisse, Picasso, and Miro. Each member of the group will contribute a "tile" that will be combined to create the group's art piece (Teacher Resource 3).}.
- Inventory geometric concepts that are found in their group art piece and assess the value of the piece.

Day 4:

- Write a painting analysis as a group to be included in the Polyart Gallery Catalogue.
- Present the group's painting and analysis to the class.

Performance Assessment (Day 5):

Read the following writing prompt (Student Resource 4):

There is great news! The Polyart Gallery dealers, Art and Polly Googlehiem, have a potential buyer for your art piece. Art and Polly need you to write a letter persuading the potential client that the piece would be a great investment. You must justify the value of your group's art by using the gallery's price chart. Be sure to identify and describe the valuable geometric elements that were used to create your group's masterpiece.

As a class, discuss the elements needed to successfully complete the writing prompt and create a rubric to self-evaluate and assess this writing piece.

Extension/Follow Up:

- Use the computer program Kid Pix by Broderbund or Tesselmania by MECC to create the student's art piece.
- Visit a local modern art gallery.
- Create a classroom gallery and invite parents to an art opening.
- Examine other artists' styles and use of geometry in their work.

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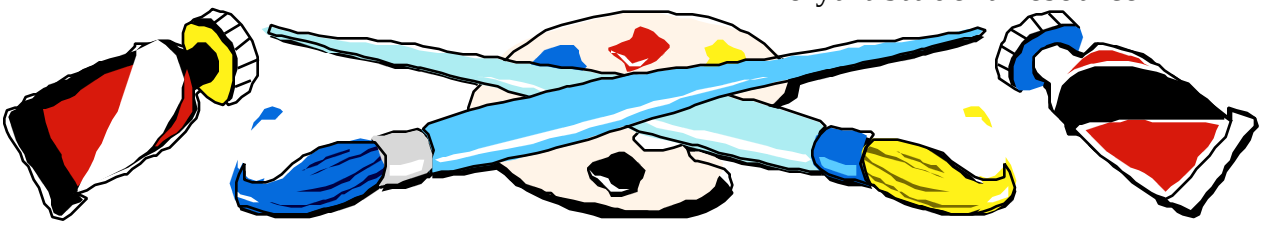
THE ART *ANGLE*

WANTED!

The Polyart Gallery is seeking contemporary art for a new show. The art should feature geometric concepts and utilize the artistic styles of Matisse, Picasso and Miro. The value of the art work will be assessed according to the type and amount of geometric concepts that are present in the art piece. High commissions will be paid for art that meets the gallery's standards.

The gallery caters to an elite clientele that seeks the finest original contemporary geometric art. If you have a piece of art that you feel meets the gallery's standards, plan to attend the Polyart Gallery's Open House.

If you have any questions or would like a copy of the current price criterion, please contact gallery dealers, Art and Polly Googleheim, @www.polyart.google.critques



Geometric Elements
Ranking Sheet

Group Members:_____

_____

Rank ten geometric concepts from the *most common* to the *least common* in the art pieces your teacher has provided.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

PRICE CRITERION

Your masterpiece can only receive credit once for each element.

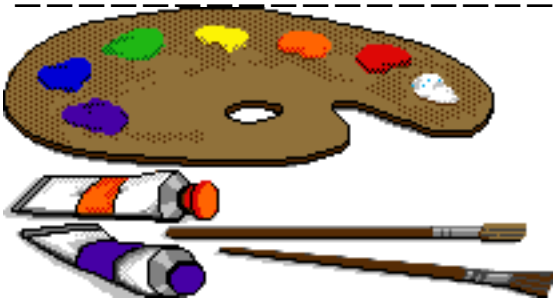
• 6 sided figure with > 1 line of symmetry	$10,025.00
• More than 8 right angles	$ 4,050.00
• Open figure	$ 1,500.00
• Evidence of tessellation	$ 8,000.00
• 5 sided figure with at least 3 right angles and 2 obtuse angles	$ 5,250.00
• Circle with the radius > 3 in.	$ 3,300.00
• Polygon with an area < 15 cm.	$ 3,005.00
• 4 sided polygon with 4 right angles	$ 600.00
• 4 sided polygon with 2 acute angles and 2 obtuse angles	$ 2,030.00
• > 2 parallel lines	$ 1,630.00
• > 2 perpendicular lines	$ 1,099.00
• Polygon with an angle > 120 degrees	$ 2,500.00
• Circle that contains a chord that is < 5 in.	$ 3,750.00
• Irregular polygon with an area > 16 cm. sq.	$ 4,245.00
• 2 congruent polygons	$ 540.00
• 2 similar polygons	$ 320.00
• Repeating pattern that contains > 4 elements in a sequence and repeats 3 times	$ 8,110.00

This sheet is designed as a guideline.
Teacher may add or delete to suit the needs of the students.

Memorandum

To: Talented Artist
From: Polyart Gallery

There is great news! The Polyart Gallery dealers, Art and Polly Googlehiem, have a potential buyer for your art piece. Art and Polly need you to write a letter persuading the potential client that the piece would be a great investment. You must justify the value of your group's art by using the gallery's price chart. Be sure to identify and describe the valuable geometric elements that were used to create your group's masterpiece.



Art Reproduction Information

The following are suggested prints that could be used in this unit. Teachers should use their own discretion in selecting prints to use in their classroom.

Matisse

- The Lagoon (1944)
- Pierrot's Funeral (1943)
- The Snail (1952)
- The Horse, the Rider, and the Clown (1943)
- Destiny (1943-44)
- Vegetable (1951)
- Flowering Ivy (1943)
- The Toboggan (1943)
- Creole Dancer (1943)
- Chinese Fish (1951)
- The Beast of the Sea (1950)

Miro

- Chriffres Et Constellation (1941)
- The Harlequin's Carnival (1924-25)
- The Gold Azure (1967)
- Dog Barking at Moon (1926)
- Catalan Landscape (1923-24)
- Dancer (1925)
- The Beautiful Bird Revealing the Unknown Pair of Lovers (1941)
- Seated Woman (1938)
- Portrait IV (1938)
- Woman Dreaming of Escape (1945)
- Painting Based on a Collage (1933)

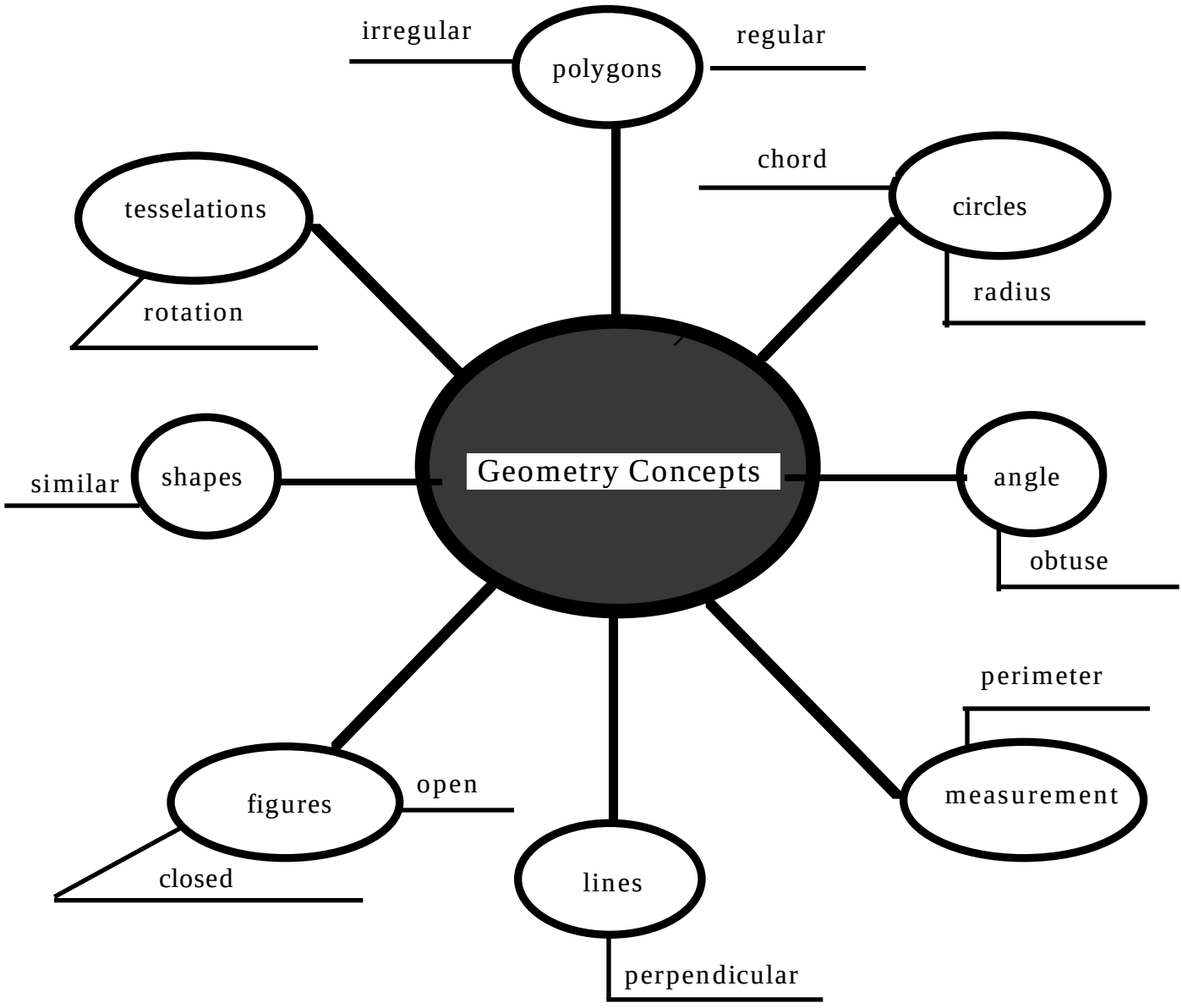
Picasso

- Paloma with an Orange (1951)
- Maya in a Pinafore (1938)
- Girl Before a Mirror (1932)
- Bather with a Beachball (1932)
- Portrait of D.H. Kahnweiler (1910)
- Three Musicians (1921)
- Weeping Women (1937)

The following are sources where reproductions of the paintings can be found:

- Mattisse Cut-Paper Design Postcards Dover Press (1989)
- Picasso and Portraiture Estate of Pablo Picasso / Artisits Rights Society (1996)
- Getting To Know the World's Greatest Artists: Picasso Children's Press (1988)
- Getting To Know the World's Greatest Artists: Matisse Children's Press (1988)
- World Wide Web @ pmwww.cs.vu.nl
- World Wide Web @ pharmdec.wustl.edu
- Your local library, art teacher, or museum are excellent sources for reproductions

Geometry Concepts Web



Four Tile Cooperative Masterpiece